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that they are only navigable in boats of light draught and at high water.

From this choking up of the fiord the glacier has ended in being unable to longer launch its icebergs; it has, therefore, found a new outlet through some other valley, where it will repeat the process of gradually filling up the fiord.

As nearly all the fiords have, or have had, glaciers in them bringing down the clayey deposits I have mentioned, the bottom must be of soft material. If the cable be taken into a fiord having a glacier, I think the clay which will be gradually deposited over it will be of great service in protecting it from injury by marine animals or other damaging agents.

The existence of these fiords is extremely advantageous to the carrying of the telegraph cable to Greenland, and there bringing it on shore. Were it not for these, some difficulties might have been met with in finding a suitable place for the landing, owing to the ice-streams on the outside coast; but in several of these fiords, Tessermiut, for example, the water is of such depth as to preclude the possibility of icebergs grounding upon the cable, and the almost perpendicular mountains forming parts of the lateral coasts of the fiords, and the deep water at their bases, offer excellent situations for leading up the cable from the middle of the fiord to the shore, without exposing it in the slightest degree to the grounding of icebergs upon it.

In conclusion, I beg to state, that from the results of seven years' observation in Greenland, I am of opinion that neither the ice nor the configuration of the coast will offer any impediment to the successful laying and landing of the telegraph cable in Greenland.

The fifth Paper read was—

5. *Electric Circuits.* By Colonel T. P. SHAFFNER, of the U. S.,
F.R.G.S., &c.

LANDING PLACES AND LENGTHS OF CIRCUITS.

Scotland to Færøe Isles.—One end of the cable for this section will be landed in one of the many safe bays in North Scotland—the precise place has not been determined. The other end it is proposed to land in a beautiful bay near Thorshaven. This section will be some 225 miles, and the depth of the sea not exceeding 254 fathoms; bottom, mud and shells.

Færøes to Iceland.—One end of the cable will probably be landed at Haldervig, near the north of Stromøe Isle. Captain Young

strongly recommends this bay, and that the other end be landed in Beruford, Iceland, a very good place, with deep water and muddy bottom. The cable to this place will be about 240 miles. Depth of sea, maximum, 683 fathoms, bottom mud and shells. It may be found more advantageous, for reasons not necessary now to be discussed, to carry the cable more westward, to or near Portland, and to which place it can be laid on a muddy and sandy bottom, in water of good depth. Both of these places, namely, Beruford and Portland, are free from any volcanic influences whatever, and ever have been, as far back as the discovery of that remarkable island in the year 863.

Iceland to Greenland.—This section will be the longest of the series, between 600 and 700 miles. Captain Young has reported in favour of Hvalfjord, a little north of Reikiavik, in the Faxe Bay; but in order to economise as to length of cable, it is quite probable that a more westerly place will be selected, on the south side of Faxe Bay. The other end of the cable he recommends be landed in Julianshaab Fiord, on the south-west coast of Greenland. He examined that beautiful bay, and found it to contain deep water, with muddy bottom; and he states that it is his decided opinion that bergs cannot reach the cable when laid in it. The reports of others concur in this opinion. There are other fiords near Cape Farewell, equally favourable. Tessermiut and Illoa Fiords are considered well suited for the cables.

Heretofore it was contemplated to land this section of the cable upon the east coast of Greenland, south of latitude 61° north, in or near Prince Christian Sound, and then, either to carry the cable out at the other end of the sound, or to connect this section with the next by a cable around Cape Farewell; or, by a line across the land, avoiding the inland ice. For the present, the intention to land on the east coast has been abandoned, not because it has been found to be impracticable, but because it has not been proved to be practicable. It is now proposed to carry the cable from Iceland, around Cape Farewell, to one of the fiords on the west side, and from the same fiord run the cable to Labrador. Hereafter the Company may find it best to land on the east coast, and carry out the original intentions as above stated.

Greenland to Labrador.—The cable will start from Greenland, and land at or near Hamilton Inlet. The soundings taken by Sir Leopold M'Clintock show 180 fathoms interior from the outer rocks on the coast, so that the cable can be laid into the inlet from the sea in water sufficiently deep to place the cable beyond the reach of icebergs. If, however, the depths be found more favourable from

the sea into Byron Bay, near and south of Cape Harrison, that place will be equally satisfactory, all questions being considered; and from thence the cable can be carried into Hamilton Inlet, through one of the several channels connecting Byron Bay with the Inlet. Length of section about 510 miles.

Before the respective cables are laid, each of the places will be carefully sounded, and buoys will be placed indicating the deep trenches; and, besides, steam tenders will be in readiness to serve as pilots. Every precaution will be taken to obtain the most complete information with regard to the depths of the bays and of the sea.

The PRESIDENT.—The Society has heard, I have no doubt with much pleasure, the very interesting Papers that have been read this evening, and to afford an opportunity for a discussion upon them, their consideration will be continued at the next meeting.

ADDITIONAL NOTICE.

Additional Instrumental Instructions to Mr. Consul PETHERICK.

By F. GALTON, Esq., Hon. Sec.

The observations that it is absolutely requisite you should make, are—

1. You are earnestly recommended to use every opportunity of practising with your sextants *upon stars* while on the Lower Nile, and able to check your results with known latitudes; also to practise observing eclipses and occultations under the same circumstances.

2. As a general rule, observations should be made at marked points, such as the confluence of rivers, prominent hills, and native towns, rather than at mere encampments.

3. Reliable latitudes of different places on the White Nile between Khartum and Gondokoro, and on your further line of travel. The latitude of Gondokoro is especially desired, and the meridian altitudes of at least six stars; three north and three south should there be observed.

4. Longitudes by the exceedingly simple methods of the eclipses of Jupiter's satellites, or of occultations of stars, to be made at Gondokoro and at the furthest point of your travel, or at places adjacent to these. The local time should there be determined by more than one set of observations, to guard against error, and the method of altitudes on both sides of the meridian should always be used. Any longitude south of the parallel of the Bahr el Ghazal would be very valuable.

5. The elevation above the sea of the following places by observation of the temperature of boiling water:—Cairo; Thebes; Assouan; Junction of Atbara; Khartum; the capital of the Shilluk country; the river at a point opposite the Bahr el Ghazal; Gondokoro, and different stations on your further route.

6. The three boiling-point thermometers to be occasionally compared, and to be carefully preserved, with the view of determining any changes in their index errors. They are also to be compared with those of Captain Speke, in